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August 15, 2001

Ms. Magalie Salas, Secretary  
Federal Communications Commission  
445 12th Street SW  
Washington DC 20554

**Re: ET Docket No. 98-153**  
**Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband**  
**Transmission Systems**  
***Ex parte Communication***<sup>1</sup>

Dear Ms. Salas:

XtremeSpectrum, Inc.<sup>2</sup> responds to an *ex parte* submission by the U.S. GPS Industry Council (GPSIC) on July 16, 2001.<sup>3</sup>

**A. Summary**

GPSIC has proposed draft rules ostensibly to govern ultra-wideband (UWB) devices and protect the noise floor. GPSIC goes so far as to characterize its proposal as "facilitat[ing] a speedy introduction of UWB devices while limiting the potential for disruption of existing

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<sup>1</sup> Pursuant to Section 1.1206(b)(1) of the Commission's Rules, I am electronically filing this written *ex parte* communication for inclusion in the above-referenced docket.

<sup>2</sup> XtremeSpectrum, with 67 employees, conducts research in ultra-wideband communications systems as its sole business. XtremeSpectrum intends to become a UWB communications manufacturer once the Commission authorizes certification of such systems. XtremeSpectrum takes no position on UWB radar applications.

<sup>3</sup> Letter from Paul R. Rodriguez and Stephen D. Baruch, Counsel for US GPS Industry Council, to Ms. Magalie R. Salas, Secretary, FCC (July 16, 2001) (GPSIC July 16 Letter).

services."<sup>4</sup> In fact, however, the proposal is calculated not to facilitate UWB, but to impede it. GPSIC asks the Commission to erect a complex regulatory structure whose sole purpose is to complicate and delay the marketing of UWB devices that pose no threat to existing services.

GPSIC has filed 22 submissions and presentation notices in this docket, all opposing UWB, and has lent its name to several others.<sup>5</sup> GPSIC's "proposed rules" filing, devoid of technical support, is just another tactic in its continuing efforts to keep UWB from the market.

Formal consideration of GPSIC's rules proposal would significantly delay the authorization of UWB, even if the proposal is ultimately rejected. Indeed, GPSIC's present request is fully consistent with its pursuit of a Further Notice in the proceeding.<sup>6</sup> All of the UWB proposals now under active consideration, including those advanced by XtremeSpectrum, were expressly raised for discussion in the original Notice, and so do not require a Further Notice.<sup>7</sup> Nor does GPSIC's submission of its proposed rules trigger a Further Notice. Nothing obliges the Commission to give even passing consideration to a proposal, like this one, that lacks any substantial merit<sup>8</sup> -- especially where a party files so late in the rulemaking that consideration will result in serious delay.

In short, GPSIC's filing is a transparent effort to derail the rulemaking. XtremeSpectrum does not believe it warrants a reply. Nevertheless, in line with its respect for the dignity of these proceedings, XtremeSpectrum will provide a reasoned response.

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<sup>4</sup> GPSIC July 16 Letter at 2.

<sup>5</sup> *E.g.*, filings of the Air Transport Ass'n, *et al.*

<sup>6</sup> Letter from Air Transport Ass'n of America, Inc., *et al.* (including GPSIC) to Chairman Michael K. Powell (May 18, 2001).

<sup>7</sup> GPSIC's demands for a Further Notice are particularly troubling, because the only departures from the original Notice now under serious consideration are those instituted in response to the interference concerns of GPSIC and its allies. Each of these proposed departures would place more stringent restrictions on UWB, solely to protect GPS and certain other services. By demanding a Further Notice, GPSIC and its allies are attempting to leverage their own success at restricting UWB into unnecessary and pointless delay.

<sup>8</sup> *Cf.* 47 C.F.R. Sec. 1.401(e) ("Petitions [for rulemaking] which are moot, premature, repetitive, frivolous, or which plainly do not warrant consideration by the Commission may be denied or dismissed without prejudice to the petitioner.")

## **B. GPSIC Proposal**

GPSIC asks the Commission to institute rules that provide for the following:

- unlicensed UWB communications limited to 6-12 GHz;<sup>9</sup>
- out-of-band emissions limited to 35 dB below Section 15.209(a) levels;
- prohibition of emissions in the Section 15.205 restricted bands;
- a "band manager" having extensive specified authority over all aspects of UWB technical design and deployment;
- a "consortium" comprising all entities that operate UWB devices, required to develop specified standards and conduct specified studies according to specified criteria; and
- collection of "[m]oney to compensate existing radio service operators."<sup>10</sup>

## **C. GPSIC's Proposed Rules Are Wholly Unnecessary.**

### **1. Other spectrum users are fully protected without GPSIC's proposed technical rules.**

GPSIC's technical proposals are all based on the incorrect premise that UWB poses an interference threat to other users of the spectrum. XtremeSpectrum has established in prior filings that the rules it recommends will eliminate risk to other users.<sup>11</sup>

XtremeSpectrum has proposed four measures to protect GPS and other services:

1. an emission mask which rolls off more steeply below 2.7 GHz than the Commission's proposal, and which affords GPS 18 dB of protection below Section 15.209(a) levels (6 dB more than the Commission proposed);

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<sup>9</sup> In addition, GPSIC proposes to permit ground penetrating radar below 1 GHz on a licensed basis, limited to public safety and protection of life or property applications, and to scientific research by accredited academic institutions.

<sup>10</sup> GPSIC does not specify any basis for compensating existing operators.

<sup>11</sup> For details on how the measures described below prevent interference to GPS and other services, see XtremeSpectrum's filings of July 25, 2001 (*ex parte* submission); May 10, 2001 (Reply Comments); April 25, 2001 (Comments); and March 12, 2001 (Reply Comments).

2. a test to reduce any spectral lines in the GPS band by an *additional* 10 dB;<sup>12</sup>
3. a restriction to indoor-only operation;<sup>13</sup> and
4. an improved measure of peak-to-average ratio.

Taken together, these steps fully protect all users of the spectrum. The additional measures that GPSIC now urges -- barring unlicensed operation below 6 GHz, requiring 35 dB attenuation of out-of-band emissions, and prohibiting operations in the restricted bands -- would offer no additional protection.

In particular, GPSIC cannot justify its call for limiting emissions below 6 GHz to 35 dB below 15.209(a) levels. All other Part 15 devices are permitted spurious or unintentional emissions at Section 15.209(a) levels even in the restricted bands<sup>14</sup> -- except for Class A digital devices which are permitted higher emissions,<sup>15</sup> and all receivers operating above 960 MHz, whose emissions are not regulated at all.<sup>16</sup> Interference from such unintentional emissions have the same practical effect (or lack of effect) as that from intentional emitters, such as UWB. Even so, XtremeSpectrum has made specific proposals that hold UWB emissions in the GPS band far below those of unintentional emitters. *XtremeSpectrum's proposals represent the lowest emissions levels specified for any unlicensed device in the Commission's Rules.* XtremeSpectrum has established that these levels of emissions are harmless. GPSIC's draconian limits would serve no purpose.

More importantly, GPSIC's proposals are incompatible with a practicable UWB communications system. If UWB manufacturers could adopt just the last proposal -- avoiding the restricted bands -- they could market their products today, with no other substantive rule changes. UWB devices fail to comply with current technical rules primarily in their need to put very limited amounts of energy into certain restricted bands.<sup>17</sup>

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<sup>12</sup> The specific test XtremeSpectrum endorses was proposed by GPSIC.

<sup>13</sup> This reflects the most likely widespread application for very low power UWB communications devices.

<sup>14</sup> 47 C.F.R. Secs. 15.109(a), 15.205(b).

<sup>15</sup> 47 C.F.R. Sec. 15.109(b).

<sup>16</sup> 47 C.F.R. Sec. 15.101(b).

<sup>17</sup> Some UWB systems would also require a change in the Commission's certification testing procedures relating to application of a pulse desensitization correction factor.

**2. Because UWB will not affect the noise floor, GPSIC's elaborate administrative rules are unnecessary.**

GPSIC's call for a band manager and consortium are based on a second wrong premise: that operation of UWB devices will affect the noise floor. That, too, is incorrect.

UWB devices cannot affect the noise floor because they cannot aggregate. A UWB communications signal at proposed power levels travels only about 10 meters, so signals from UWB devices farther apart than 10 meters cannot add. Even an ordinary indoor wall stops much of the UWB signal, so a signal originating in one room barely makes it through the wall to an adjoining room. Thus, even the signals from adjacent rooms cannot aggregate. The signals simply die out faster than they add up.

An analogy may help to clarify the point. Suppose the TVs in every room of a hotel are all playing at once. A person in one of the rooms would hear that TV, of course, and might barely hear the immediate neighbors' -- but not any of the others. A person outside the hotel would hear nothing at all from inside. This is because the walls block most of the sound. In just the same way, the very limited propagation of UWB devices prevents their signals from aggregating. Only the nearest UWB transmitter can ever be even a potential source of interference.

For this reason, UWB units cannot add to raise the noise floor across a city, or even a city block. Surprisingly, the measured emissions from a building-wide UWB network, even with hundreds of units, will measure less than 2.5 times the signal strength of a single UWB unit! UWB is safe for the radio environment, both individually and in large multiples.

GPSIC's band manager and consortium to monitor and maintain the noise floor are nothing more than complex solutions to a problem that does not exist.<sup>18</sup>

**CONCLUSION**

UWB is a promising technology that can offer the public extremely high-capacity, low-cost, energy-efficient communications over short distances. The extensive record in this proceeding has established that UWB devices complying with XtremeSpectrum's proposals will not cause harmful interference to other services. If GPSIC still disagrees with that result, it should file its data and analyses, and debate the issue on the merits. The Commission should not

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<sup>18</sup> The Commission has authorized band managers only for the very limited roles of facilitating spectrum leasing of private radio services, and preventing interference among adjacent full-power services. There is no place for a band manager in an unlicensed environment, where the rules already require an unlicensed device to cease operation if it causes harmful interference to a licensed service. *See* 47 C.F.R. Sec. 15.5(b), (c).

entertain GPSIC's advocating patently impracticable rules for the seeming purpose of causing distraction and delay.

If there are any questions about this filing, please call me at the number above.

Respectfully submitted,

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